Small Business Innovation Research/Small Business Tech Transfer

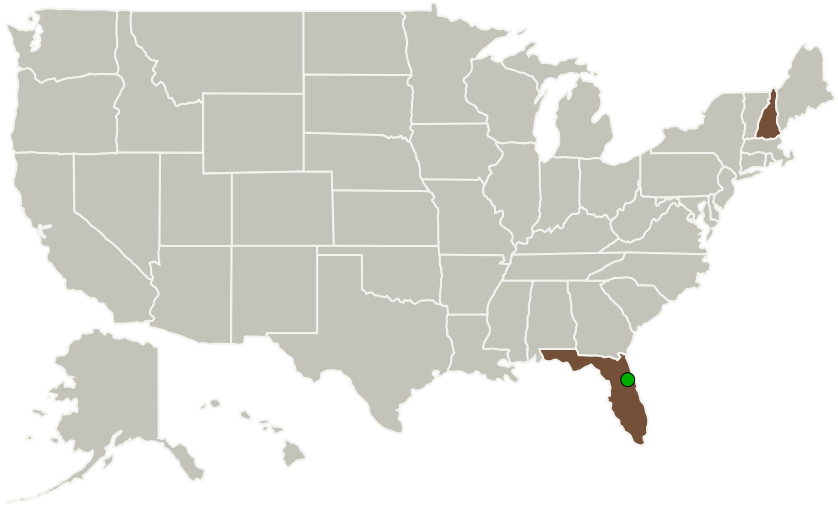
Dust Separation and Measurement System for Mars ISRU Applications, Phase I

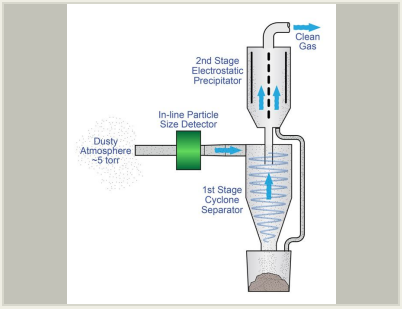
Completed Technology Project (2014 - 2014)

Project Introduction

NASA has recognized that in future exploration and human missions to Mars, the problem of Martian dust contaminating gas processing systems and human habitats will need to be solved. The dust content of Martian atmosphere is only sparsely known, and in particular the variation over the surface and the dust particle size distribution are largely unknown. Creare proposes to develop a compact, integrated dust separation and measurement system that is capable of measuring dust size distribution and removing 99% of all dust particles larger than 0.3 micron. The two-stage separator is robust and scalable, combining the strengths of inertial and electrostatic precipitators with a novel Mie scattering sizing sensor. The dust separation and measurement system will be able to integrate with and handle flow requirements as defined for the NASA Mars 2020 Announcement of Opportunity Demonstration Oxygen Production Plant and shows a clear development path to future in situ resource utilization (ISRU) production plants. In Phase I, Creare proposes to develop, design, and test key components of the design in the lab to determine their feasibility for Martian operation. In Phase II, Creare plans to develop and deliver a prototype compact, integrated dust separation and measurement system.

Primary U.S. Work Locations and Key Partners





Dust Separation and Measurement System for Mars ISRU Applications Project Image

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Organizations Performing Work	Role	Type	Location
Creare LLC	Lead Organization	Industry	Hanover, New Hampshire
Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida

Primary U.S. Work Locations	
Florida	New Hampshire

Project Transitions

June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137755)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Creare LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

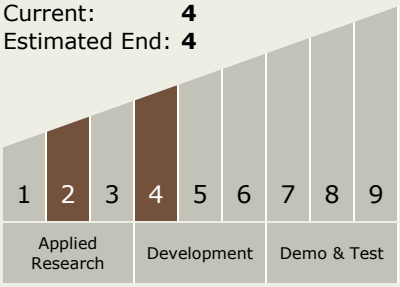
Carlos Torrez

Principal Investigator:

Paul H Sorensen

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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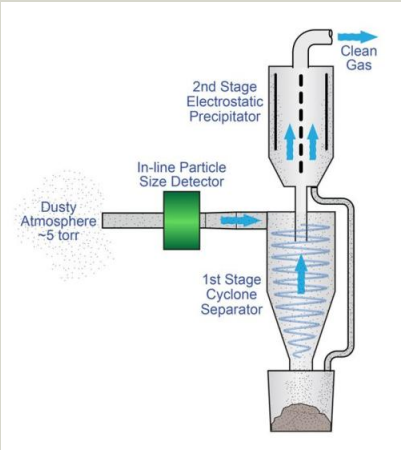
Images



Project Image
Dust Separation and Measurement System for Mars ISRU Applications Project Image
(https://techport.nasa.gov/image/134607)

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.5 Particulate Contamination Prevention and Mitigation

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System